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Major article

# Demographic characteristics of patients and their assessment of selected hygienic practices of hospital personnel in the context of safety climate of hospitalization

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***Background:*** Hand hygiene (HH) is a key factor in hospital infection prevention and patient safety. The objectives of this article were to examine patients' observations concerning compliance with selected procedures for hospital hygiene among medical personnel and assess the correlation between patients' key demographic characteristics and their awareness and sense of safety associated with hospitalization.
***Methods:*** The study was conducted in January 2012 on a sample of 491 subjects by means of a standardized 10-minute computer-assisted telephone interview survey.
***Results:*** There was a statistically significant correlation between the sense of safety associated with hospitalization declared by patients and their observation of HH practices among health care personnel. A positive correlation was also found between the respondents experiencing personal complications in the form of health care–associated infections themselves or among their family members and the sense of safety associated with hospital treatment.
***Conclusions:*** Performing HH among hospital staff is one of the factors affecting patients' increased sense of safety during their hospitalization; therefore, HH contributes to the perception of good quality of service provided. Knowledge of the risk of HH does not affect the patients' sense of safety, in contrast with their real-life experiences.



According to the World Health Organization's definition, patient safety is defined as "patient's freedom from unnecessary real or potential harm caused by healthcare." Its significance in health care systems all over the world is increasing.

Infections associated with health care are among the most common adverse effects in health protection.[1,2]

There is a need for changes in behavior and organization in health care institutions and also a necessity to provide information to patients and empower them in their involvement in safety improvement.

In the United States, public reporting of various kinds of hospital infections has been introduced and discussed for decades.[3,4] Thanks to long-term developments and thorough studies of hospital epidemiology, the United States is the world leader in infection control.

In Poland, the history of control of health care–associated infections is not that long, dating back to the 1990s. Theoretically, organization and scope of health care–associated infections surveillance in Polish hospitals are consistent with world standards. However, in practice, there are still areas requiring education and improvement (eg, basic issues of hand hygiene [HH], use of personal protective barrier equipment).[5-8]

In recent years, a global campaign, SAVE LIVES: Clean Your Hands, promoting My 5 Moments for Hand Hygiene, has been carried out.[9] It is aimed at health care professionals, for whom HH is one of the fundamental elements of everyday work, securing patient's safety.[10,11] However, patients themselves should not be excluded from the framework of education programs because they could contribute to the improvement in following correct procedures for HH among medical staff.[12-14]

Patients' awareness of their rights has been growing in Poland. This includes the possibility of claiming compensation for medical harm, including harm connected with health care–associated infections.

According to our assessment, however, little is known about Polish patients' awareness of the risk of health care–associated

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**Table 1**
Respondents' characteristics and their attitudes toward selected safety aspects of hospitalization

| Patient characteristics | Total (N = 490) | Sense of safety associated with hospital stay | | *P* value |
|---|---|---|---|---|
| | | Yes | No | |
| Patients' sex | | | | |
| Women | 335 (68.4) | 314 (68.3) | 21 (70) | .84 |
| Men | 155 (31.6) | 146 (31.7) | 9 (30) | |
| Patients' age (y) | | | | |
| <55 | 152 (31.2) | 137 (30) | 15 (50) | .04 |
| 55-70 | 198 (40.7) | 187 (40.9) | 11 (36.7) | |
| >70 | 137 (28.1) | 133 (29.1) | 4 (13.3) | |
| Patients' education | | | | |
| Primary or vocational secondary | 183 (37.5) | 178 (38.9) | 5 (16.7) | <.05 |
| Secondary or postsecondary | 203 (41.6) | 187 (40.8) | 16 (53.3) | |
| University | 102 (20.9) | 93 (20.3) | 9 (30) | |
| Hospital type | | | | |
| Public | 459 (95) | 429 (94.7) | 30 (100) | .39 |
| Private | 24 (5) | 24 (5.3) | 0 (0) | |
| Size of place of residence (scale 1-7), median (quartile 1-quartile 3) | 2 (1-3) | 2 (1-3) | 2 (2-3) | .37 |
| Size of town in which the hospital was located (scale 1-7), median (quartile 1-quartile 3) | 3 (2-5) | 3 (2-5) | 3 (2-5) | .92 |
| Awareness of infection risk during hospital stay | | | | |
| Patient or someone in the patient's closest circle experienced hospital infection | 77 (22.8) | 66 (20.8) | 11 (55) | <.01 |
| Patient heard of hospital infection risk | 326 (68.1) | 307 (68.2) | 19 (65.5) | .76 |
| Open talks about infections in hospital | 71 (22.7) | 70 (23.8) | 1 (5.3) | .09 |
| Observing the behavior of personnel as regards hand hygiene | | | | |
| Staff washed and disinfected their hands before each examination | 222 (70.9) | 218 (75.2) | 4 (17.4) | <.01 |
| Staff put on gloves before each examination | 424 (91.8) | 406 (92.9) | 18 (72) | <.01 |
| Staff walked around the ward in gloves | 121 (33.9) | 115 (34.3) | 6 (27.3) | .46 |
| Personnel's gowns were clean | 482 (99.4) | 455 (99.8) | 27 (93.1) | .01 |

NOTE. Values are n (%) or as otherwise indicated.

infections and their expectations concerning safety in the health care system, particularly safe hospital treatment.

There is no doubt, however, that patients should be informed on safety standards, best practices or safety measures, and ways of accessing clear information on complaint and compensation programs.

## OBJECTIVES

The objective of the study was to describe patients' opinions regarding the safety of hospitalization in Polish hospitals, with a particular focus on their awareness of the risk of health care–associated infections, and their observations about compliance with selected procedures for hospital hygiene among medical personnel. The study took into consideration the impact of patients' key demographic characteristics with regard to their awareness and sense of safety associated with hospitalization.

## MATERIAL AND METHODS

The study was conducted between January 11, 2012, and January 18, 2012, using a sample of 491 subjects (31% men, 69% women) by means of a standardized 10-minute computer-assisted telephone interview survey. The research was conducted by the IQS Group Market Research Agency within an education program (Stop Hospital Infections. Hospital Hygiene Promotion Program) of the Polish Society of Hospital Infections. Respondents were randomly selected from the database of Polish telephone operators. Interviewers were professional market research workers and asked standardized questionnaire questions.

Respondents included in the analyses were >18 years old and had been hospitalized within 6 months preceding the interview (if the person was younger or had not been hospitalized, the conversation was discontinued). The study sample was representative in terms of the size of the city and province of residence (Voivodeship).

Most respondents were hospitalized because of health deterioration (36%), in connection with preplanned surgery (24%), because of worsening symptoms of a chronic illness (16%), and because of the need for special diagnostics (15%). The smallest groups were women hospitalized because of childbirth (2%) and patients hospitalized because of an accident (5%). Reasons other than the aforementioned reasons were reported by 4% of the respondents.

The respondents were interviewed about the sense of safety associated with their hospital stay, their awareness, their possible previous experiences of health care–associated infections (their own or that of families and friends), and their opinion regarding some of the medical personnel's practices with respect to health, in particular their use of protective gloves and washing and disinfection of hands.

The study was based on methodology developed by the sociologic sciences. No sensitive personal data or information relating to the process of treatment were used. As a result, no ethics approval was required, according to Polish law.

The method of logistic regression was used for evaluation of the statistical significance of the correlation between demographic characteristics of the patients, their knowledge and experience connected with health care–associated infections, the attention paid to the use of basic preventative measures (eg, HH among staff), and the sense of safety accompanying hospitalization. Calculations were made using SPSS software (SPSS, Chicago, IL); $P < .05$ was adopted as the borderline level of statistical significance.

## RESULTS

Most respondents felt safe during their hospital stay. This opinion was expressed by 92% of the respondents, of which 65% felt absolutely safe; others felt relatively safe. A significantly smaller share of patients did not feel safe during their hospitalization. Out of 6% of the respondents sharing this opinion, 4% felt relatively unsafe, and a further 2% felt definitely not safe. The remaining 2% of the respondents were indecisive about their perception of a sense

**Table 2**
Risk factors of decreased safety associated with hospitalization according to patients' answers (ordinal logistic regression model)

| | 1-dimensional model | | Multidimensional model | |
|---|---|---|---|---|
| Patients' characteristics | OR (95% CI) | *P* value | OR (95% CI) | *P* value |
| Patients' sex (men vs women) | 0.83 (0.55-1.24) | .37 | – | – |
| Patients' age (y) | | | | |
| 55-70 vs <55 | 0.61 (0.40-0.94) | .03 | – | – |
| >70 vs <55 | 0.39 (0.23-0.64) | <.01 | – | – |
| Age (y) | 0.98 (0.97-0.99) | <.01 | – | – |
| Age (ranged according to subcategory) | 0.75 (0.64-0.90) | <.01 | 0.75 (0.61-0.94) | .01 |
| Education | | | | |
| Secondary vs primary or vocational secondary | 1.05 (0.68-1.60) | .84 | – | – |
| University vs primary or vocational secondary | 1.53 (0.93-2.51) | .09 | – | – |
| Size of place of residence | 0.95 (0.84-1.08) | .43 | – | – |
| Size of town in which the hospital was located | 0.99 (0.86-1.14) | .91 | – | – |
| Hospital type (private vs public) | 0.49 (0.18-1.33) | .16 | | |
| Patient or sb of the patient's closest circle experienced hospital infection | 2.59 (1.56-4.31) | <.01 | 2.73 (1.59-4.68) | <.01 |
| Staff washed and disinfected their hands | | | | |
| Yes vs no | 0.22 (0.13-0.37) | <.01 | 0.31 (0.16-0.58) | <.01 |
| Hard to say vs no | 0.36 (0.21-0.59) | <.01 | 0.52 (0.19-0.89) | .04 |
| Staff put on gloves | 0.23 (0.12-0.44) | <.01 | 0.41 (0.19-0.89) | .02 |
| Staff walked around the ward in gloves | 0.89 (0.57-1.40) | .621 | – | – |
| Patient heard of hospital infection risk | 1.44 (0.96-2.16) | .082 | – | – |
| Open talks about infections in the hospital | 0.60 (0.34-1.60) | .078 | – | – |

*CI*, confidence interval; *OR*, odds ratio; –, for data not significant in 1-dimensional analysis, multidimensional assessment was not performed.

**Table 3**
Determinants of patients' awareness of the risk of health care–associated infections (logistic regression model)

| | 1-dimensional model | | Multidimensional model | |
|---|---|---|---|---|
| Patients' characteristics | OR (95% CI) | *P* value | OR (95% CI) | *P* value |
| Patients' sex (men vs women) | 0.83 (0.56-1.29) | .45 | – | – |
| Patients' age (y) | | | | |
| 55-70 vs <55 | 0.61 (0.38-0.96) | .04 | 0.65 (0.40-1.07) | .09 |
| >70 vs <55 y | 0.51 (0.31-0.85) | .01 | 0.66 (0.37-1.11) | .11 |
| Age (y) | 0.98 (0.97-0.99) | .04 | – | – |
| Age (ranged according to subcategory) | 0.85 (0.71-1.03) | .09 | – | – |
| Education | | | | |
| Secondary vs primary or vocational secondary | 2.33 (1.52-3.57) | <.01 | 1.99 (1.28-3.08) | .02 |
| University vs primary or vocational secondary | 4.76 (2.59-8.74) | <.01 | 4.09 (1.20-7.58) | <.01 |
| Size of place of residence | 1.07 (0.93-1.21) | .35 | – | – |
| Size of town in which the hospital was located | 1.12 (0.97-1.30) | .12 | – | – |
| Hospital type (private vs public) | 5.18 (1.20-2.32) | .03 | 4.30 (0.98-18.95) | .05 |

*CI*, confidence interval; *OR*, odds ratio; –, for data not significant in 1-dimensional analysis, multidimensional assessment was not performed.

of safety during stay in the hospital. Data including respondents' characteristics are presented in Table 1.

A statistically significant positive correlation between the declared sense of safety associated with hospitalization was found for patients' age. In comparison with patients <54 years old, lack of sense of safety in relation to feeling relatively or absolutely safe was nearly 40% lower among patients aged 55-70 and >60% lower among those aged <70 years (Table 2).

There was no statistically significant relation between declared sense of safety and place of residence, location of the hospital of treatment (size of the town), or status of the hospital (private vs public). A significant correlation with the degree of patient's sense of safety in the hospital was not determined by the level of information on the risk of infection during stay in the hospital (incidental information or detailed discussions of the infection risks). Detailed data are presented in Table 1.

There was a statistically significant correlation between the patient's or family member's previous personal experience with health care–associated infections or the observation of staff's HH practices by the respondents and their sense of safety during hospitalization (Table 1). If the patients, their families, or friends, had experienced health care–associated infections, their sense of insecurity in the hospital grew significantly (Table 2). The risk of a lack of a sense of safety in relation to feeling relatively or absolutely safe was about 2.6 times higher in these patients (95% confidence interval [CI], 1.56-4.31).

Respondents declaring that staff washed and disinfected their hands before each examination and put on gloves felt more secure during their hospital stay. The odds ratio for a lack of safety in relation with feeling relatively or absolutely safe in people declaring HH before each test was 78% lower than those declaring no handwashing and disinfection among hospital staff (Table 2). Respondents who could not decide whether the staff washed and disinfected their hands before each examination also displayed a lower risk of a sense of insecurity in the hospital (by 64%) than those indicating a lack of HH (Table 2).

Most of the variables affecting the level of patients' sense of safety in the hospital that were significant in a 1-dimensional model remained statistically significant in multidimensional analysis (Table 2). The influence of age was at the same level in the 1-dimensional analysis, similar to encountering infections among family or in the environment. Patients declaring that the staff washed and disinfected their hands before each examination and put on gloves also exhibited a greater extent of safety. The odds ratio for a lack of a sense of safety in relation to feeling relatively or absolutely safe in individuals declaring handwashing and disinfection before each test was almost 70% lower than those declaring no washing and disinfection of hands. The respondents who could not decide whether the staff washed and disinfected their hands before each examination also displayed a lower (by 48%) risk of a sense of insecurity in the

hospital than those indicating a lack of HH (Table 2: multidimensional model).

Awareness of the risk of health care–associated infections was significantly associated with age and education of the respondents and the type of hospital (Table 3). The chance that the patients had heard of the possibility of health care–associated infections decreased with the increase in the patients' age and increased with the increase in the level of education. The chance that patients were aware of hospital-acquired infections was 2.3 times higher (95% CI, 1.52-3.57) in patients with secondary education and >4.5 times higher (95% CI, 2.59-8.74) in those with a university degree compared with patients with primary or vocational education.

Patients in private hospitals were more aware of infections than those in public hospitals (odds ratio = 5.18; 95% CI, 1.20-22.32).

Sex, place of residence, or size of the hospital were not associated with awareness of health care–associated infections among patients.

In the multidimensional analysis, only education was found to affect the odds of occurrence of patients' awareness regarding health care–associated infections (Table 3).

## CONCLUSIONS

Both 1- and multidimensional statistical analyses of the results confirmed that observing the HH practices of the staff by the patient significantly correlates with a sense of safety of hospitalization. Nearly half (45%) of the respondents also noted that staff washed and disinfected their hands in situations involving contact with the patient; however, less than half of them declared that HH occurred both before and after contact. The results of this study appear to be more optimistic than the results of the observational study performed by Garus-Pakowska et al[5,6] on a group of 188 medical workers in 6 Polish hospitals, which demonstrated compliance with the theoretical requirements of HH practices only in a small fraction (>12%). The cited study reported a higher rate of compliance with HH procedures among doctors than nurses (16.8% vs 4.7%), which was contrary to results of other studies.[15,16] The percentage of HH practice compliance with recommendations in the study by Garus-Pakowska et al is considerably lower even than the corresponding values reported by other authors for periods prior to the implementation of educational campaigns and programs aimed at improving compliance with the basic principles among medical personnel. Seto et al[11] observed the output proportion of HH practice compliance with the procedures as 41% and observed its increase over the 5-year period of intensive educational activities to a level of 83%. Tromp et al[17] reported an increase in the average percentage of HH practice compliance with theoretical recommendations from 27%-75%.

The role of HH in the prevention of health care–associated infections, and therefore in the improvement of quality of health care services and patient safety, is undisputed. Hence, the educational and promotional campaigns of the World Health Organization have been in operation for a decade in various countries.[18,19] Recommendations for HH based on scientific evidence and effective tools for education and promotion,[20,21] are commonly available. In Polish hospitals, following the recommended procedures for HH among medical personnel is one of the examples of areas that still require intensive education and improvement. The Polish campaign promoting HH in health care units was almost a decade overdue. In addition to the already quoted results by Garus-Pakowska et al, the need for such actions is also confirmed by the data obtained under the Prevention of Hospital Infections by Intervention and Training program. The results of the program showed that the use of alcohol-based handrubs in Polish hospitals is lower than the mean value for European countries, and pocket-belt dispensers are not used.[8]

As shown by the results of the present study, the correct application of HH procedures among health care professionals has an impact on patients' sense of safety.

Another noteworthy element of this research is the fact that patients' sense of safety during hospitalization is not significantly modified by their theoretical knowledge of the possibility of infection. Their personal experience plays the main role in this respect. Following procedures for HH by hospital personnel and rapid eradication of existing health care–associated infections are factors influencing the growth of patients' sense of safety.

For hospitals and other health centers this may be relevant for implementation of information policies for patients and in efforts aimed at improving the quality of services, with prompt and effective reaction in the event of health care–associated infections.

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